

FUEL ANALYSIS REPORT

REPORT NO	H180786811 [AMBER]	REPORT DATE	06-Jul-2018
VESSEL	HYDERABAD	CUSTOMER	PACIFIC BASIN SHIPPING HK LTD
IMO NUMBER	9278789	ATTN	TECHNICAL DEPARTMENT

CONFORMANCE

The fuel sample tested conforms to Table 2 of ISO 8217:2010 specifications for grade IFO 380 - RMG 380

ITEMS TO NOTE

No Alerts for this fuel. See points 4, 11, 13

ENGINE FRIENDLINESS NUMBER (EFN)	44	(poor) 1 to 100 (good)
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SAMPLE INFORMATION / BDN INFORMATION

Grade	IFO380-RMG380	Ship Quantity	1050.000 MT
Bunkered Port	CRISTOBAL-PANAMA	Supplier Quantity	1050.000 MT
Bunkered Date	19-Jun-2018	Seal Status	Sealed
Lab Seal No.	2086427/2114657		
Supplier	MINERVA BUNKERS PTE. LTD.	Sent From	PANAMA CITY-PAN,
Barge	GREAT PORTOBELLO	Date Sample Sent	25-Jun-2018
Sample From	MANIFOLD	Date Sample Recd	06-Jul-2018

SPECIFIED PARAMETERS FOR IFO380-RMG380 & TEST RESULTS

#	Parameters / Units	Test Results	Specification Limits	Supplier Data
1	Density @15°C kg/m³	988.3	Max 991.0	987.1
2	Viscosity @50°C cSt	347.2	Max 380.0	365.0
3	Flash Point °C	> 70.0	Min 60.0	
4	Upper Pour Point °C	6	Max 30	
5	Micro Carbon Residue % (m/m)	11.97	Max 18.00	
6	Ash % (m/m)	0.057	Max 0.100	
7	Water % (v/v)	0.17	Max 0.50	-
8	Sulfur % (m/m)	2.57	Max 3.50	2.5700
9	Vanadium mg/kg	157	Max 350	
10	Total Sediment Potential% (m/m)	0.04	Max 0.10	
11	Al + Si mg/kg	44	Max 60	
12	Sodium mg/kg	23	Max 100	
13	CCAI	850	Max 870	
14	Acid Number mg KOH/g	1.0	Max 2.5	

USED LUBRICATING OIL (ULO)

15	Zinc mg/kg	10	15
16	Phosphorus mg/kg	6	15
17	Calcium mg/kg	35	30

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ADDITIONAL PARAMETERS

#	Parameters / Units	Test Results
18	Viscosity @100°C cSt	33.09
19	API Gravity	11.6
20	Aluminium mg/kg	23
21	Silicon mg/kg	21
22	Iron mg/kg	28
23	Lead mg/kg	< 1
24	Nickel mg/kg	29
25	Magnesium mg/kg	3
26	Potassium mg/kg	2
27	GCMS-CRA	COMPLETED
28	pH	6.18
29	Reserve Stability Number	IN PROGRESS
30	Stability	IN PROGRESS
31	Strong Acid Number mg KOH/g	0.00
32	Xylene Equivalence	33.30

CALCULATED VALUES

#	Parameters	Values
33	Net Specific Energy MJ/kg	40.32
34	Gross Specific Energy MJ/kg	42.62
35	Temperature for injection viscosity of 13 cSt °C	133
36	Minimum Transfer Temperature	42
37	Engine Friendliness Number	44

COMMENTS & SUGGESTIONS

Injection Viscosity (cSt)	8	10	11	12	13	15	18	20
Temperature for Injection (°C)	155.1	144.2	139.9	136.0	132.6	126.9	120.0	116.2

NO PAPER WORK RECEIVED

Total acid number was found to be 1.0 mgKOH/g. Although this value is within spec as per ISO 8217:2010, this value is higher than normal for this port (normally less than 0.4 mgKOH/g). The recent problem fuels from Houston areas had acid number ranging from 0.4 to 0.9 mgKOH/g.

The below is a statement from the annex of ISO 8217:2005 about acid number.

“Fuels with high acid numbers arising from acidic compounds occasionally have caused accelerated damage to marine diesel engines. Such damage has been found primarily within the fuel injectors and associated pumps. These failures have resulted shortly after commencement of use of the bunker-fuel supplies.

Testing fuels for acid number can give indications as to the likely presence of acidic compounds.”



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SUGGESTIONS AND RECOMMENDATIONS TO SHIP OWNERS / OPERATORS / TECHNICAL STAFF

CALCULATION OF QUANTITY SUPPLIED BASED ON LAB TESTS

Quantity supplied as per ship (MT)	1050.000
Density as per BDN Kg/m ³	987.1
Density as per lab test Kg/m ³	988.3
Water as per lab test %(v/v)	0.17
Quantity shortage due to density (MT)	
Quantity shortage due to water (MT)	
Total Quantity Shortage (MT)	

*Above figures do not account for ISO 4259 criteria given in ISO 8217 Annex F

4 Upper Pour Point

Observation:

Heat and store this fuel at 10°C above the measured pour point temperature.

11 Catfines

Observation: Catfines content (Aluminum +Silicon) in fuel is high.

Catfines cause high wear in rubbing surfaces of cylinder and fuel system. If the catfines content is less than 15 ppm, wear and tear for the engine will be minimal. Increased catfine content will increase the wear rate.

Purify continuously and recirculate the fuel several times to bring down the catfines content.

13 CCAI

Observation: Ignition delay is indicated by CCAI greater than 840 for mediumspeed engines and greater than 870 for lowspeed engines.

OVERALL QUALITY

Engine Friendliness Number (EFN) is a unique bench-mark of fuel quality evaluated by VISWA LAB from the point of view of engine wear and tear resulting from the use of this fuel. Based on EFN, which is calculated from the analysis results listed in this report, the quality of this fuel is slightly below average.

Over hundreds of thousands of samples tested, it has been noted that when EFN is greater than 60, there is generally no fuel related problems and when EFN is below 40, problems can be expected. Please note that EFN calculation does not take into account the presence of any contaminants in the fuel.

NOTE: The conformance of this fuel to the contracted specifications may have no relationship to the evaluation of this fuel based on EFN.

On behalf of Viswa Lab

Signed:

Simha V

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All the test methods will be referenced/equivalent test methods specified in ISO 8217:2010

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Viswa Lab Houston is an ISO/IEC 17025:2005 laboratory for testing accredited by Perry Johnson Laboratory Accreditation Inc, Accreditation #
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